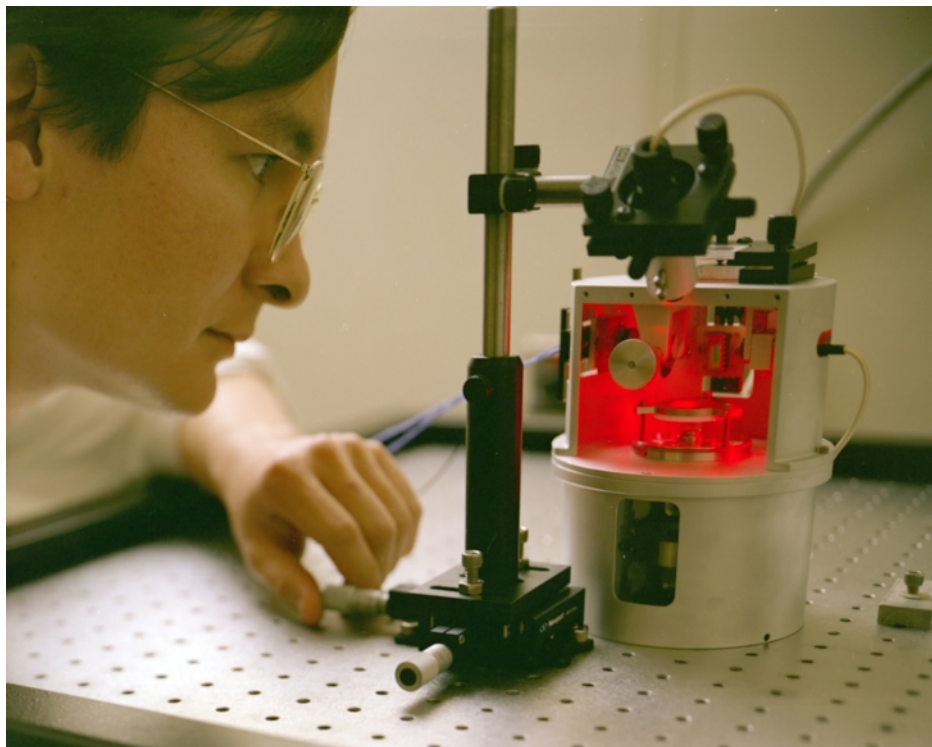


# ATOMIC FORCE MICROSCOPY



Atomic force microscope used to measure the binding interaction between individual molecules in liquid media

The atomic force microscope (AFM) is a relatively new analytical tool that enables scientists to image many different types of surfaces—metals, insulators, polymers, biomaterials—with nanometer-scale resolution. The heart of the AFM is a small microfabricated cantilever beam that serves as the force-measuring device. It has a force sensitivity of  $10^{-15}$  N/Hz<sup>1/2</sup> and a position accuracy of 0.01 nm, which surpasses other measurement techniques and allows direct measurement of the interaction forces between molecules. At the Naval Research Laboratory (NRL), we have used the AFM to measure the molecular interaction forces between individual ligand-receptor molecules and single strands of DNA. These measurements promise to provide new insight into the fundamental forces responsible for structure and function in molecular biology and have led NRL to develop a novel sensor based on force amplification.

## *Point of Contact*

Naval Research Laboratory  
4555 Overlook Avenue, SW • Washington, DC 20375-5320

Dr. Richard J. Colton • Chemistry Division • (202) 767-0801  
e-mail • rcolton@stm2.nrl.navy.mil